## WHAT IS CLAIMED IS:

1.      A process for producing derivatized, well-dispersed carbon nanotubes (CNTs), said process comprising reacting an underivatized CNTs with an ionizing agent, thereby generating anions on the surface of said underivatized CNTs.

2.      The process of claim 1, wherein said CNT is a SWNT.

3.      The process of claim 1, wherein said CNT is a MWNT.

4.      The process of claim 1, wherein said ionizing agent is an alkyllithium salt.

5.      The process of claim 4, wherein said alkyllithium salt is *sec-*butyllithium.

6.      The process of claim 1, further comprising quenching said anions with an alcohol, thus producing alkyl-derivatized, well-dispersed CNTs.

7.      The process of claim 1, further comprising reacting said anions on the surface of said CNTs with an agent that places functional groups attached to the CNTs, thus producing derivatized, well-dispersed CNTs comprising functional groups that are attached to the CNTs.

8.      The process of claim 7, further comprising grafting a polymer onto the CNT surface via a functional group.

9.      The process of claims 7, further comprising incorporating said derivatized, well-dispersed CNTs into a matrix.

10.      The process of claims 8, further comprising incorporating said derivatized, well-dispersed CNTs into a matrix.

11.      The process of claim 10, wherein said matrix is the same or different than the polymer grafted to said derivatized, well-dispersed CNTs.

12.    The process of one of claims 9 or 10, wherein said matrix is a polyamide, polyester, polyurethane, polysulfonamide, polycarbonate, polyurea, polyphosphonoamide, polyarylate, polyimide, poly(amic ester), poly(ester amide), a poly(enaryloxynitrile) matrix or mixtures thereof.

13.    The process of one of claims 9 or 10, wherein said matrix is a sulfur containing polymer matrix or a liquid crystalline(LC) thermotropic main-chain polyester and copolyester matrix.

14.    The process of claim 13, wherein said sulfur containing polymer matrix is an aromatic polydithiocarbonate matrix or a polythiocarbonate matrix.

15.    The process of one of claims 9 or 10, wherein said matrix is a matrix of a poly(ester amide)s related to nylons and polyesters.

16.    The process of claim 15, wherein said polyester is a 6,10 or a 12,10 polyester.

17.    The process of claim 15, wherein said nylon is a 6,10 or a 12,10 nylon.

18.    The process of one of claims 9 or 10, wherein said matrix is a matrix of aromatic-aliphatic poly(enaminonitriles) (PEANs), cross-linked polyamide network, cross-linked polyester network, fluorine-containing, methylene-bridged aromatic polyesters or a blue luminescent polyethers.

19.    The process of one of claims 9 or 10, wherein said matrix is a matrix of polycarbonate/polybutylene terphthalate (PC/PBT), polycarbonate/polyethylene terephthalate (PC/PET), polyamide (PA) reinforced with modified polyphenylene ether (PPE), polyphenylene suphide (PPS), polybutylene terephthalate (PBT), polyethylene terephthalate (PET), polyetherimide, expandable polystyrene poly(2,6-dimethyl-1,4-phenylene ether (PPE), modified polyphenylene ether (PPE), polycarbonate (PC), acrylic-styrene-acrylonitrile (ASA), polycarbonate/acrylonitrile-butadiene-styrene (PC/AILS) or acrylonitrile-butadiene-styrene (ABS).

20.     The process of claim 7, wherein said functional groups are directly attached to the CNT surface.

21.     The process of claim 7, wherein said functional groups are indirectly attached to the CNT surface.

22.     The process of claim 7, wherein said functional groups are selected from the group consisting of $CO_2H$, OH and $NH_2$.

23.     The process of claim 7, wherein said agent that places functional groups attached to the CNT surface is selected from the group consisting of $CO_2$, ethylene oxide and X(alk)NRR', where X is Br or Cl, alk is a $C_{1-6}$ alkyl chain and R and R', together with the nitrogen to which they are attached, form a 2,2,5,5-tetralkyl-2,5-disilacyclopentane ring.

24.     The process of claim 8, wherein said polymer is a polyamide, polyester, polyurethane, polysulfonamide, polycarbonate, polyurea, polyphosphonoamide, polyarylate, polyimide, poly(amic ester), poly(ester amide), a poly(enaryloxynitrile) or mixtures thereof.

25.     A process for producing derivatized, well-dispersed carbon nanotubes (CNTs) comprising functional groups that are attached to the CNT surface, said process comprising:

(a)     reacting underivatized CNTs with an ionizing agent thereby generating anions on the surface of the underivatized CNTs; and

(b)     reacting said anions on the surface of said CNTs with agents that place functional groups attached to the CNT surface.

26.     The process of claim 25, wherein said ionizing agent is *sec*-butyllithium and said CNTs are SWNTs.

27.     The process of claim 25, wherein said agent that places functional groups attached to the CNT surface is selected from the group consisting of $CO_2$,

ethylene oxide and X(alk)NRR', where X is Br or Cl, alk is a $C_{1-6}$ alkyl chain and R and R', together with the nitrogen to which they are attached, form a 2,2,5,5-tetralkyl-2,5-disilacyclopentane ring.

28.    The process of claim 25, wherein said functional groups are directly attached to the CNT surface and said functional groups comprise COOH.

29.    The process of claim 25, wherein said functional groups are indirectly attached to the CNT surface and wherein said functional groups are selected from the group consisting of OH and $NH_2$.

30.    The process of claims 25, further comprising incorporating said derivatized, well-dispersed CNTs into a matrix.

31.    A process for producing derivatized, well-dispersed carbon nanotubes (CNTs) comprising functional groups that are attached to the CNT surface, said process comprising:

(a)    reacting underivatized CNTs with an ionizing agent thereby generating anions on the surface of the underivatized CNTs;

(b)    reacting said anions on the surface of said CNTs with agents that place functional groups attached to the CNT surface; and

(c)    grafting first polymer onto the CNT surface via said functional groups.

32.    The process of claim 31, wherein said ionizing agent is *sec*-butyllithium and said CNTs are SWNTs.

33.    The process of claim 31, wherein said agent that places functional groups attached to the CNT surface is selected from the group consisting of $CO_2$, ethylene oxide and X(alk)NRR', where X is Br or Cl, alk is a $C_{1-6}$ alkyl chain and R and R', together with the nitrogen to which they are attached, form a 2,2,5,5-tetralkyl-2,5-disilacyclopentane ring.

34.   The process of claim 31, wherein said first polymer is a polyamide, polyester, polyurethane, polysulfonamide, polycarbonate, polyurea, polyphosphonoamide, polyarylate, polyimide, poly(amic ester), poly(ester amide), a poly(enaryloxynitrile) or mixtures thereof.

35.   The process of claim 31, wherein said functional groups are directly attached to the CNT surface and said functional groups comprise COOH.

36.   The process of claim 31, wherein said functional groups are indirectly attached to the CNT surface and wherein said functional groups are selected from the group consisting of OH and $NH_2$.

37.   The process of claims 31, further comprising incorporating said derivatized, well-dispersed CNTs into a matrix or wherein the first polymer forms a matrix of a composite polymer-CNT material.

38.   A process for producing polymer-derivatized, well dispersed carbon nanotubes (CNTs) comprising:

(a)   reacting polymer anions with underivatized CNTs thereby generating anions on the surface of the CNTs; and

(b)   quenching said anions with an alcohol, thus producing first polymer-derivatized, well-dispersed CNTs.

39.   The process of claim 38, further comprising incorporating said polymer-derivatized CNTs into a second polymer matrix different from the first polymer.

40.   The process of claim 38, wherein the first polymer forms a matrix of a composite polymer-CNT material.

41.   A process for producing polymer-derivatized, well-dispersed, carbon nanotubes (CNTs) comprising:

(a)    reacting underivatized CNTs with an ionizing agent thereby generating anions on the surface of the underivatized CNTs;

(b)    reacting said anions on the surface of said CNTs with a first polymer thereby grafting the first polymer onto the CNTs.

42.    The process of claim 41, wherein the step of reacting with a polymer comprises reacting the CNTs with a monomer thereby polymerizing the monomer to form a first polymer grafted to the CNT surface.

43.    The process of claim 41, wherein the first polymer comprises a vinyl polymer.

44.    The process of claim 41, further comprising incorporating said polymer-derivatized CNTs into a second polymer matrix different from the first polymer.

45.    The process of claim 41, wherein the first polymer forms a matrix of a composite polymer-CNT material.

46.    A composite material comprising derivatized, well-dispersed CNTs, wherein said CNTs are well-dispersed in a polymer matrix; and wherein said CNTs comprises at least one of functional groups on their surface, a polymer grafted directly to the CNT surface, or a polymer grafted onto the CNT surface via the functional groups.

47.    The composite material of claim 46, wherein the composite material is incorporated an article selected from the group consisting of light emitting diode (LED), liquid crystal displays (LCD), photovoltaic device, Schottky Junction device solar cell, a pseudo-low work function electrical contact in an electron transport device, an electro-optic device, an electron emission gun, a photovoltaic device, a nanoelectronic device, a gas, radiation or thermal sensor, an antistatic material, an active electronic material in a device architecture, the active component in temperature/pressure responsive material, the active component in bioactive article,

the active component in engineering resin, a thermal conductor, a thermal insulator, a thread, a web, a pellet or a thin film.

48.    The composite material of claim 46, wherein the composite material is made by the process of claims 25, 38 or 41.